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Evolutionary genetics of *Wolbachia*-induced parthenogenesis in the parasitoid *Asobara japonica*

Sex determination and sexual decay

Wen-Juan Ma

1. Manipulation of arthropod reproduction by endosymbionts occurs in almost all developmental stages. There is increasing evidence that endosymbionts also interfere with the genetic cascade of host sex determination and downstream sexual differentiation.
(This thesis, Chapter 2 and Sugimoto & Ishikawa 2012 *Biol Lett*8: 412-415)
2. To convincingly rule out Multi-locus Complementary Sex Determination, inbreeding experiments need to be performed over multiple generations and extended by simulation models.
(This thesis, Chapter 3, de Boer *et al.* 2008 *Genetics*180: 1525-1535 & 2012 *Evol Appl*5: 444-454)
3. Linkage map construction is hampered by the absence of genetic exchange, which restrains genetic studies of traits in asexual species. One of the solutions is to construct a linkage map from offspring of crosses between sexual and asexual populations/species.
(This thesis, Chapter 4)
4. Bacterial titer matters regarding gender and ploidy of asexual parasitoid wasps.
(This thesis, Chapter 5 and Tuljetske 2010 PhD thesis)
5. After the transition from sexual to asexual reproduction, the decay of female traits related to sexual reproduction may surprisingly be dependent on single loci.
(This thesis, Chapter 6)
6. Given the ubiquitous symbiosis of bacteria and eukaryotes, it makes sense to re-phrase Dobzhansky's words as: 'nothing in biology makes sense except in the light of coevolution'.
7. Doing a PhD is the process of being educated to be an independent researcher. Technical skills should not be considered equally important as critical thinking, though training of both skills is necessary.
8. PhD students should never blindly agree with their supervisors or academic authorities. Conversely, supervisors should educate and encourage their PhD students to question them and debate with them.
9. Proposals of fundamental research would probably get funded with equal chance as those in applied fields, if the public was equally embarrassed by not knowing that antibiotics are used to kill bacteria as by not knowing the name of their current prime minister.
10. To reduce or eliminate bias during the manuscript reviewing process, double blind reviewing or open reviewing should be seriously considered.
11. In science, nothing should be accepted without ascertaining the logics behind.
12. It is more difficult to prove the absence than the presence of something.
13. Gender stereotype should be tackled in order to achieve gender equality, which would also certainly reduce the underrepresentation of women in science.
14. China's high GDP annual growth rate (>7.5%) would probably collapse if most Chinese (if not all) were trained in critical thinking and could freely and independently apply this into their life.
15. When cultural traditions clash with scientific knowledge, we need to know which side we are on. It is usually worth the pain to challenge traditional beliefs.